Beam Power Tube

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage (AC or DC) .............. 6.3 ± 10% volts
Current at 6.3 volts ............ 0.9 amp
Direct Interelectrode Capacitances
(Approx.):
Grid-No.1 to plate ............. 0.6 μμf
Grid-No.1 to cathode & grid No.3,
grid No.2, and heater .......... 10 μμf
Plate to cathode & grid No.3,
grid No.2, and heater .......... 6.5 μμf

Characteristics, Class A1 Amplifier:
Plate Voltage .................. 250 volts
Grid-No.2 Voltage .............. 250 volts
Grid-No.1 Voltage .............. -14 volts
Plate Resistance (Approx.) .... 22500 ohms
Transconductance .............. 6000 μμhos
Plate Current .................. 72 ma
Grid-No.2 Current ............. 5 ma

Mechanical:
Operating Position ............. Any
Maximum Overall Length ......... 4-1/4" 
Maximum Seated Length ........ 3-11/16"
Diameter ....................... 1.438" to 1.562"
Bulb ................................ T-12
Base. . . Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12),
Short Medium-Shell Octal 7-Pin with External Barriers
Style A (JEDEC Group 1, No.B7-111) or
Style B (JEDEC Group 1, No.B7-119), or
Short Medium-Shell Octal 6-Pin with External Barriers
Style A (JEDEC Group 1, No.B6-148) or
Style B (JEDEC Group 1, No.B6-122)
Basing Designation for BOTTOM VIEW .......... 7AC

AF POWER AMPLIFIER — Class A1

Maximum Ratings, Design-Maximum Values:
PLATE VOLTAGE ................ 500 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE ... 450 max. volts
GRID-No.2 INPUT ............... 5 max. watts
PLATE DISSIPATION ............. 30 max. watts
PEAK HEATER–CATHODE VOLTAGE:
Heater negative with respect to cathode... 200 max. volts
Heater positive with respect to cathode. . 200* max. volts

Typical Operation and Characteristics:

<table>
<thead>
<tr>
<th>Fixed-Bias Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage.........</td>
</tr>
<tr>
<td>Grid-No.2 Voltage.....</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 Voltage</td>
</tr>
<tr>
<td>Zero-Signal Plate Current.</td>
</tr>
<tr>
<td>Max.-Signal Plate Current.</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current.</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current.</td>
</tr>
<tr>
<td>Plate Resistance (Approx.).</td>
</tr>
<tr>
<td>Transconductance .......</td>
</tr>
<tr>
<td>Load Resistance .......</td>
</tr>
<tr>
<td>Total Harmonic Distortion.</td>
</tr>
<tr>
<td>Max.-Signal Power Output .</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cathode-Bias Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage ...</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
</tr>
<tr>
<td>Cathode Resistor ........</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 Voltage</td>
</tr>
<tr>
<td>Zero-Signal Plate Current.</td>
</tr>
<tr>
<td>Max.-Signal Plate Current.</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current.</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current.</td>
</tr>
<tr>
<td>Load Resistance .......</td>
</tr>
<tr>
<td>Total Harmonic Distortion.</td>
</tr>
<tr>
<td>Max.-Signal Power Output .</td>
</tr>
</tbody>
</table>

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
For fixed-bias operation .............. 0.1 max. megohm
For cathode-bias operation ........... 0.5 max. megohm

AF POWER AMPLIFIER — Class A

Triode Connection — Grid No.2 Connected to Plate

Maximum Ratings, Design-Maximum Values:

| PLATE VOLTAGE .......... | 450 max. volts |
| PLATE DISSIPATION ...... | 30 max. watts |
| PEAK HEATER–CATHODE VOLTAGE: |
| Heater negative with respect to cathode. . 200 max. volts |
| Heater positive with respect to cathode. . 200* max. volts |
Typical Operation and Characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Fixed Bias</th>
<th>Cathode Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>250 volts</td>
<td>250 volts</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td>-20 volts</td>
<td>- volts</td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td></td>
<td>490 ohms</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 Voltage</td>
<td>20 volts</td>
<td>20 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>40 ma</td>
<td>40 ma</td>
</tr>
<tr>
<td>Maximum-Signal Plate Current</td>
<td>44 ma</td>
<td>44 ma</td>
</tr>
<tr>
<td>Plate Resistance (Approx.)</td>
<td>1700 ohms</td>
<td>- ohms</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Transconductance</td>
<td>4700 µmhos</td>
<td>- µmhos</td>
</tr>
<tr>
<td>Load Resistance</td>
<td>5000 ohms</td>
<td>6000 ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>5 %</td>
<td>6 %</td>
</tr>
<tr>
<td>Maximum-Signal Power Output</td>
<td>1.4 watts</td>
<td>1.3 watts</td>
</tr>
</tbody>
</table>

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
- For fixed-bias operation: 0.1 max. megohm
- For cathode-bias operation: 0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>500 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 (SCREEN-GRID) VOLTAGE</td>
<td>450 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 INPUT</td>
<td>5 max. watts</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>30 max. watts</td>
</tr>
<tr>
<td>PEAK HEATER-CATHODE VOLTAGE:</td>
<td></td>
</tr>
<tr>
<td>Heater negative with respect to cathode</td>
<td>200 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>200* max. volts</td>
</tr>
</tbody>
</table>

Typical Operation and Characteristics:

Unless otherwise specified, values are for a tubes

<table>
<thead>
<tr>
<th></th>
<th>Fixed Bias</th>
<th>Cathode Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>250 volts</td>
<td>250 volts</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
<td>250 volts</td>
<td>250 volts</td>
</tr>
<tr>
<td>Grid-No.1 Voltage</td>
<td>-16 volts</td>
<td>-17.5 volts</td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td>-124 ohms</td>
<td>-124 ohms</td>
</tr>
<tr>
<td>Peak AF Grid-No.1-to- Grid-No.1 Voltage</td>
<td>32 volts</td>
<td>35 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>120 ma</td>
<td>134 ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>140 ma</td>
<td>155 ma</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current</td>
<td>10 ma</td>
<td>17 ma</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current</td>
<td>16 ma</td>
<td>17 ma</td>
</tr>
<tr>
<td>Plate Resistance (Approx., per tube)</td>
<td>24500 ohms</td>
<td>23500 ohms</td>
</tr>
<tr>
<td>Transconductance (Per tube)</td>
<td>5500 µmhos</td>
<td>5700 µmhos</td>
</tr>
<tr>
<td>Effective Load Resistance (Plate to plate)</td>
<td>5000 ohms</td>
<td>5000 ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>2 %</td>
<td>2 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>14.5 watts</td>
<td>17.5 watts</td>
</tr>
</tbody>
</table>
Maximum Circuit Values:
Grid-No.1-Circuit Resistance:
For fixed-bias operation........... 0.1 max. megohm
For cathode-bias operation........ 0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB₁
Maximum Ratings, Design-Maximum Values:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>500 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 VOLTAGE</td>
<td>450 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 INPUT</td>
<td>5 max. watts</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>30 max. watts</td>
</tr>
<tr>
<td>PEAK HEATER–CATHODE VOLTAGE:</td>
<td></td>
</tr>
<tr>
<td>Heater negative with respect to cathode</td>
<td>200 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>200* max. volts</td>
</tr>
</tbody>
</table>

Typical Operation:
Values are for 2 tubes

<table>
<thead>
<tr>
<th>Component</th>
<th>Fixed Bias</th>
<th>Cathode Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>360 450 450</td>
<td>360 volts</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
<td>270 350 400</td>
<td>270 volts</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid)</td>
<td>-22.5 -30 -37</td>
<td>- volts</td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td>- - 248</td>
<td>ohms</td>
</tr>
<tr>
<td>Peak Af Grid-No.1-to-</td>
<td>45 60 70 40.6</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No.1 Voltage</td>
<td>88 95 116 88</td>
<td>ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>132 194 210 100</td>
<td>ma</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current</td>
<td>5 3.4 5.6 5</td>
<td>ma</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current</td>
<td>15 19.2 22 17</td>
<td>ma</td>
</tr>
<tr>
<td>Effective Load Resistance</td>
<td>6600 6000 5600 9000</td>
<td>ohms</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>2 1.5 1.8 4</td>
<td>%</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>26.5 50 55 24.5</td>
<td>watts</td>
</tr>
</tbody>
</table>

Maximum Circuit Values:
Grid-No.1-Circuit Resistance:
For fixed-bias operation........... 0.1 max. megohm
For cathode-bias operation........ 0.5 max. megohm

PUSH-PULL AF AMPLIFIER — Class AB₂
Maximum Ratings, Design-Maximum Values:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>500 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 (SCREEN-GRID) VOLTAGE</td>
<td>450 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 INPUT</td>
<td>5 max. watts</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>30 max. watts</td>
</tr>
<tr>
<td>PEAK HEATER–CATHODE VOLTAGE:</td>
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</tr>
<tr>
<td>Heater negative with respect to cathode</td>
<td>200 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>200* max. volts</td>
</tr>
</tbody>
</table>

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.
Typical Operation:

Values are for 2 tubes

<table>
<thead>
<tr>
<th></th>
<th>Fixed Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>360 360 volts</td>
</tr>
<tr>
<td>Grid-No.2 Voltage</td>
<td>225 270 volts</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td>-18 -22.5 volts</td>
</tr>
<tr>
<td>Peak AF Grid-No.1 to Grid-No.1 Voltage</td>
<td>52 72 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>78 88 ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>142 205 ma</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current</td>
<td>3.5 5 ma</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current</td>
<td>11 16 ma</td>
</tr>
<tr>
<td>Effective Load Resistance (Plate to plate)</td>
<td>6000 3800 ohms</td>
</tr>
<tr>
<td>Peak Grid-Input Power</td>
<td>140 270 mw</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>2 2 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>31 47 watts</td>
</tr>
</tbody>
</table>

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
- For fixed-bias operation .......... 0.1 max. megohm
- For cathode-bias operation .......... Not recommended

* Without external shield.
* On the 6-pin bases, pin 1 as well as pin 6 is omitted.
* The dc component must not exceed 100 volts.
* In push-pull circuits where grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, it is permissible for this voltage to be as high as 500 volts.
* The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.
* Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB2 stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB2 stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

OPERATING CONSIDERATIONS

The bulb becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.
AVERAGE CHARACTERISTICS

Eφ = 6.3 VOLTS
PLATE VOLTS = 300
GRID-N#2 VOLTS = 300

OPERATION CHARACTERISTICS
Push-Pull Class AB₁

Eφ = 6.3 VOLTS
PLATE VOLTS = 450
GRID-N#1 VOLTS = -30
AF GRID-N#1 TO GRID-N#1 VOLTS (RMS) = 42.5
GRID-N#2 VOLTS = 350

POWER OUTPUT
POWER OUTPUT - WATTS
EFFECTIVE LOAD RESISTANCE (PLATE TO PLATE) - OHMS
HARMONIC DISTORTION
TOTAL HARMONIC DISTORTION - PER CENT

92CS-10126
92CS-9575